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ABSTRACT

This study focuses on children's reflectiveness about their drawings, and on the effect of other children's presence on the drawer's verbalizations about the drawing process and product. It was hypothesized that children would talk more about their representational efforts in the presence of other children, and that planning and evaluative or critical statements would developmentally emerge later than less reflective types of remarks such as labeling and describing things. The subjects were 21 boys and 13 girls from two age groups (ages 3 years 5 months to 4 years 1 month and 4 years 3 months to 4 years 10 months) of a predominantly middle class preschool. The children drew in groups of three or four in a small room adjacent to the classroom. These drawing sessions were held 10 times, approximately every two weeks throughout the school year. The experimenter made an open-ended suggestion for the topic of the drawing, which was always something the children all had done during the week. The sessions were recorded on audiotape and coded from the tape by one of two observers who was present during the drawing periods. Peer drawing sessions revealed a greater diversity of commentary than solitary interviews with children. Both age groups used many labeling and descriptive statements in reference to their drawings, but only the older children showed a significant level of planning, self-evaluative, or peer-evaluative statements. In general, planning and evaluation were either both present or both absent. (Author/SS)

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Children's Commentary while Drawing in Small Groups: The Growth of Reflective and Critical Tendencies

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A. Introduction

Numerous developmental and cognitive psychologists of diverse theoretical orientations have been attracted to children's drawings and paintings as sources of study. Some of the researchers have concerned themselves primarily with the developmental changes of a qualitative nature which occur in the ostensive features of the art productions. For example, Golomb (1974), Goodnow (1977), Fenson (1977) and Peck (1976) have studied features which change with development. These changes have ranged from Peck's interest in the correlations between picture parts, such as the incorporation of the horizon line, and Piagetian operations which also utilize coordinate systems, to Fenson's study of the conservative reapplications of certain drawing routines and subroutines throughout the development of artistic skills.

Other researchers have concerned themselves primarily with individual differences in intelligence or cognitive style as witnessed in the drawings, notably Goodenough (1926) and Harris (1963). Comparing the work, beginning with Goodenough and Harris and proceeding through Golomb, Fenson, etc., it is easy to see that this research topic spans a considerable period of time.

Reference to children's drawings has cropped up also in Piaget's writings at various points. In discussing general intellectual development, Piaget has supported the research efforts which relate children's drawings to cognitive functioning. Piaget contends that the structuration of space and the child's drawings progress through the same stages of development. Elsewhere, in discussions of play behavior and in his treatment of mental

imagery, Piaget also points to examples of children's graphic productions. Drawings, for children, have attributes of play; they are pleasurable and they are self-directed activities. Drawings also have an important feature in common with the mental image, in that there is some attempt to represent reality. Thus, Piaget concludes that drawing is ". . . a form of the semiotic function which should be considered as being halfway between symbolic play and the mental image" (1969, p. 63). Children's copies of reality, or visual realism, are not done with great skill when they are four and five years of age. Their drawings, however, reflect what they know about reality. Our research approach has been to focus on what children know about objects and events, rather than to look at their imitations of reality. As such, this paper reports research designed to study children's conceptual knowledge, rather than their perceptual abilities. The source for studying children's conceptualizations is what they have to say about objects and events as they draw.

Recent studies report that it would be instructive for developmental psychologists to take note of children's comments as they draw, since these verbal data might reveal information which is critical to our understanding of what the child is doing while constructing the art work. Gardner (1973), Golomb (1974), and Serpell (1975), to note three, have all stated this point, but unfortunately no one has reported data of this sort. Even Vygotsky, who places considerable emphasis upon children's verbal abilities (1978), has considered these as important data for a very long time, but he also fails to report any studies which analyze such behavioral characteristics.

B. Representational Competence

The first question is why this is an important problem. We have already stated that Piaget argues the importance of drawings and that others have related children's drawings to intellectual skills. What theoretical issues are being tested in this research? Of research interest here is the broad topic which can be labeled Representational Competence.

Representation can be viewed as the act of re-presenting, i.e., bringing previous thoughts, ideas, words, etc. back into awareness or consciousness (Sigel & Cocking, 1977, p. 161). Recalling experiences and retelling them is a typical example where the recall is a re-presentation to one's self of a previous experience. This definition of representation is a further refinement of the meaning of internal representation. In common to both, however, is that representation involves the mental activity of bringing any experience into awareness.

To understand what is going on as the children construct their pictures is one route to understanding the emergence of symbol systems in human beings. Our problem, then, is to try to find a way to study symbol systems and the relationships between these symbol systems and human functioning. Vygotsky (1978) has pointed out that while he and others like himself have focused a great deal of their research on the language symbol system, the links among man's symbol systems have not been plotted very well.

C. Drawing and Verbal Commentary

There are two views of the meaning of the collateral behaviors of drawing and verbalization. One view is that the drawing represents a "verbally directed" behavior (Butterworth, 1977; Litt, 1977; Meili-Dworetzki, 1957; Vygotsky, 1978). This is an interpretation which Vygotsky gives to the co-occurrence of children's commentary as they draw. A second interpretation of the meaning of these co-occurring behaviors is the "representational thought" interpretation (Fenson, 1977; Golomb, 1974; Serpell, 1975). Both types of research relate the verbal behaviors to the drawing, but one type relates the verbalizations to the drawing product, while the latter type of research relates them to the drawing process.

Recent research has brought us away from the older view of children's drawings which implied that the pictures are a way of inferring the existence of a mental representation. These studies have asked whether the names of objects call up mental representations and the results indicate that the descriptions of the common objects match the children's drawings fairly well. What such approaches ignore, however, are the constraints imposed by cognition. That is, there are certain constraints imposed by cognitive processes and research which tries to relate the cognitive aspects of the behavior ought to incorporate these constraints into the design. Three classes of constraints cause Freeman (1977), for example, to reject drawings as a data source. These three classes figure prominently into the rationale of the present study using children's verbalizations as they draw as a tool for studying cognitive functioning.

1-Memory: In reconstructing an event, many items are available to the child through memory, but the memory retrieval is not efficient and therefore many parts are excluded from the drawing.

We would point out, however, that verbal exchanges, which occur when children draw in small groups, frequently center on such omissions or inaccuracies of reconstruction. The verbal behaviors are seen as a representational tool which helps bridge another representational domain--the graphic.

2-Serial Order: Often it is difficult for the child to execute the parts of the drawing in sequence.

We would point out that sequencing and planning statements emerge as the children become more reflective about the tasks of representation.

3-Frame-of-Reference: Children don't have the concept of frame-of-reference.

This is difficult for children and means different things depending upon the age of the child under consideration. The frame-of-reference for a three-year-old who has not done much drawing might not include all picture elements into one picture; each part of what we adults would consider to constitute one picture might be separated, so that each part of the construction is placed on a separate page. The page on which the child draws is itself another type of frame-of-reference which is difficult to learn how to use: if the drawing is begun too near the top of the page, there's not enough room for building upward. This is where one begins to

hear the children make organizational planning statements. We are interested in studying these verbalizations as anticipatory behaviors, and to check to see if Vygotsky's suggestions about the monitoring functions of verbalizations are at work.

Points 1-3, it may be concluded, move into the second interpretation of the meaning of the collateral behaviors of drawing and verbalization--the representational thought model.

Verbal Data

Why are verbal data particularly relevant? The cognitive ability of representational thinking is the key to answering the question. But, to investigate the development of representational competence and the increasing consciousness of the child as she/he is drawing representationally, a great deal of information is lost unless the comments of the children while they draw are also examined. These processes can be seen as indicators of this emerging ability which Piaget terms "reflective abstraction." A related and also frequently overlooked set of behaviors which would seem to reflect this growing consciousness is the children's reactions to each other's drawings and the verbalizations which emerge as representational activities occur in small groups of children. These reactions to peer drawings are not only revealing in what they tell about the commentor; they are also of considerable importance in forming a picture of social and situational effects on the development of representational competence.

D. The Present Study[1]

Two research implications stem directly from the literature just presented: (1) children's drawings and attendant verbalizations are potentially rich data sources for investigating problem solving and thought strategies vis-à-vis a representational model of cognitive growth; and (2) small group processes are more likely to yield valid and more representative linguistic sampling than individual tests or free-speech samplings. With these two principles in mind, a project was designed in order to study alternative methods of generating valid speech sampling.

Three- and four-year old children enjoy drawing and engaging in drawing with peers nearby. This is a commonplace spontaneous occurrence in the preschool. Simulating this situation, we invited them in groups of three or four to small group rooms apart from their nursery school classrooms to draw in large drawing books. We provided a topic for each drawing session, and we always avoided what might be termed a "singular" target for the children to produce. For example, we would never ask the children to draw a car, or a bus, but rather our topics always focused upon the children's common experiences so that they could have a dialogue from

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06/77-01/79: A study of children's representational equivalences

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a common perspective. We were interested in how they reconstructed their experiences and how they might transform aspects of their environments. We were looking at representational competence, but by this we did not mean their drawing abilities per se. One element of representational competence in which we were interested was the children's growing awareness that something with which they had direct experience could be depicted graphically, in a two-dimensional space.

The subjects were 21 boys and 13 girls from two groups of a predominantly middle class preschool. Half the children were between 3-5 and 4-1 and half between 4-3 and 4-10 at the beginning of the data collection. The drawing sessions were held ten times, approximately every two weeks throughout the school year. Sessions 4 through 10 were observed for the present study. The sessions were recorded on audiotape and coded from the tape by one of two observers who was present during the drawing periods. Interobserver reliability ranged from .84 to .92.

From the total set of coded categories, the following subset was examined for this investigation: Naming or labelling of picture elements ("This is my dad," "Look at the grass"); Description of the appearance or location of picture elements ("The snowman's hat is black," "Car on the road"); Planning of subject, technique, or sequence ("I'm gonna draw my daddy," "I'll draw the table first"); Evaluation of Peer Picture/Skill ("That's not a boy--you drew a dress!" or "If that's a table, how come it has six things for legs?"); Evaluation of Own Picture/Skill ("I made a good space ship").

Results indicated that planning and evaluation were collateral behaviors as hypothesized: on the whole, children either showed both or neither of these verbalization types. Both age groups used many labelling and descriptive

statements in reference to their drawings, but it was only the older children who showed a significant level of planning, self-evaluative, or peer-evaluative statements (see Diagram).

These categories reflect the child's organization of experiences. The verbal expression of the organization does something else, however. These verbalizations objectify the experiences. The child can once again become an actor on his or her object of reconstruction or anticipation. Hence explicit verbalizations allow the child to engage in objectified planning, sequencing, evaluation, and other commentary about a world which is known to him but which is no longer physically present. The effect is feedback, where feedback serves as a reality check for reconstructions and as hypothesis-testing for anticipations (Cocking & Copple, 1979).

Validity

The reliability of the technique as a way of gathering and coding children's verbal reconstruction was reported to be between .84 - .92. The validity, of course, is the important aspect to focus upon. The results and the coder reliabilities speak to the usefulness of the technique for gathering verbal data, but the rationale for exploring the procedures as an alternate to formalized testing stems from a serendipitious finding from the pilot research.

The children who were the subjects in the pilot work came from two nursery school programs, one of which was traditional in its curriculum and approach to teaching, the other a cognitive-based curriculum which utilized an inquiry-teaching strategy. The second program was clearly one which focused upon representational thinking, although no teaching was geared to drawing skills. A program comparison was made which produced

Jeff (age 4): "I'm gonna make a table."

Anna (age 3): "You only made two legs. A table has four legs."

Jeff: "These are the legs in front, dummy. The back legs are behind. "Now I made the juice pitcher . . . Gatorade!"

Anna [laughing]: "Jeff, what's that thing comin' out of the pitcher? A snake?"

Jeff: "No! That's the juice coming out. It's going into my cup."

the treatment effects reported in Table 1.

Insert Table 1 about here

These results in favor of the cognitive model program were surprising since the children had been randomly assigned to treatment conditions and programs had been equated on the following variables: (1) receptive vocabulary, as measured by the Peabody Picture Vocabulary Test (PPVT); (2) receptive syntax, as measured by the Bellugi-Klima comprehension test; and (3) productive language, as measured by a modified version of the Potts test of Syntactic Structures. Thus, while verbal skills were comparable across two different preschool programs, the effect of the cognitive program which was geared toward representational thinking was evidenced by the strong treatment effect in the analysis of variance. It should also be mentioned that the ANOVAs were run with percentage data, rather than raw data from the coded drawing protocols. This procedure had the effect of minimizing individual differences among the children in the amount they talked. That is, task-relevant categories from the coded protocols were adjusted by each child's own overall total amount of verbalization. Thus, sheer amount of talking, which might have been different in one program as compared to the other, was not an influencing factor. The results, then, speak to the validity of this technique for detecting verbal interactions which relate to reconstructive memory, and hence, representational thought.

In an early section of this report, we pointed out that representational competence is, in part, the skill of bringing previous experiences to bear upon present circumstances. Naming events, labelling them, planning and

Table 1

Verbal Data from Children's Drawings

Analyses of Variance Using Percentage Data

SOURCE	SS	df	MS	F	p
Self-Naming					
Treatment	.17	1	.17	15.64	.0005
Self-Planning					
Sex	.14	1	.14	6.5	.02
Treatment	.08	1	.08	3.7	.06
Sex X Age	.12	1	.12	6.65	.02
Peer-Naming					
Sex	.002	1	.002	3.01	.09
Sex X Age	.002	1	.002	3.43	.08
Peer-Describing					
Sex X Age	.001	1	.001	4.42	.05
Sum: Naming & Describing					
Treatment	.15	1	.15	7.25	.01
Sum: Evaluation & Planning					
Sex	.07	1	.07	2.88	.10
Treatment	.09	1	.09	3.58	.07
Sex X Age	.10	1	.10	4.53	.04
Total					
Between					
Sex	.005	1	.005	3.75	.06
Within					
Sex X Task	.29	9	.03	2.7	.005
Treatment X Task	.51	9	.06	4.7	.000
Sex X Age X Task	.30	9	.03	2.89	.003

sequencing one's activities, and the like are behaviors which are employed in this reconstructive process. The verbal categories which reached significance in the present research were those which would be expected from such a view of representational competence (see Table 1).

E. Summary and Implications

Listening to what children have to say as they try to remember something and then reconstruct it is the approach suggested for studying how cultural and linguistic differences affect the way in which knowledge and intellectual skills are used. This cognitive model of knowledge challenges two types of memory in children: recognition and reconstruction. The method of having 3-4 children draw a picture of a common experience in a small group setting is a particularly promising device for eliciting verbalization in young minority group children (Labov, 1970; Copple, 1970). The assumption has long been that linguistic differences of dialect-speaking populations limit performance. The cognitive model of representational thinking posits that language can aid the child by providing a bridge with the graphic domain when peer influences and a meaningful task are provided which elicit the linguistic behaviors. The theoretical significance lies in the cognitive-linguistic link, while the practical significance is the potential usefulness as a non-traditional assessment method and as a classroom assessment tool which teachers might be trained to use.

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